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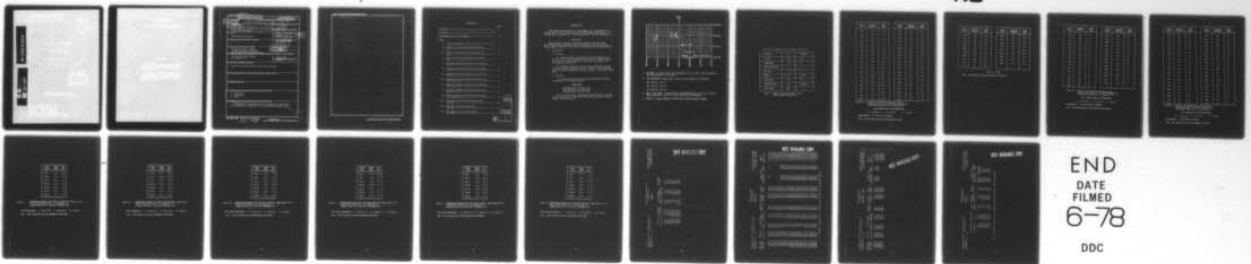
ARMY ELECTRONICS COMMAND WHITE SANDS MISSILE RANGE N--ETC F/G 4/2
19301A GSRS MISSILE NO. V-1, ROUND NO. V-1 (5 DECEMBER 1977).(U)
MAR 78

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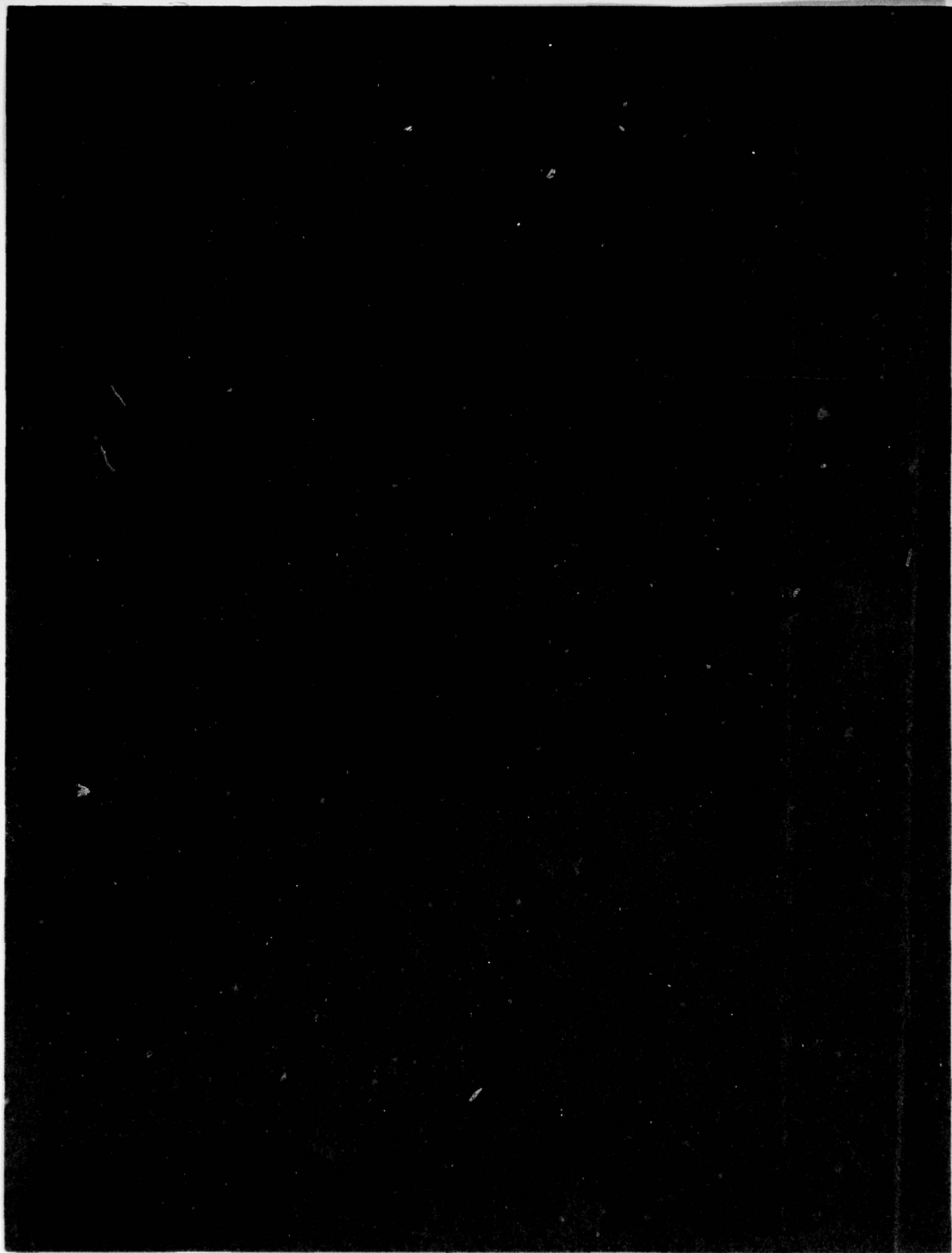
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM	
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) 1. Ballistics 2. Meteorology 3. Wind			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Meteorological data gathered for the launching of 19301A GSRS, Missile Number V-1, Round No. V-1, are presented in tabular form.			

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ABSTRACT

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INTRODUCTION

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INTRODUCTION

19301A GSRS, Missile Number V-1, Round Number V-1, was launched from launcher 519 at LC-33, White Sands Missile Range (WSMR), New Mexico, at 1000 HRS MST, 5 December 1977. The scheduled launch time was 1000 HRS MST.

DISCUSSION

Meteorological data were recorded and reduced by the White Sands Meteorological Team, Atmospheric Sciences Laboratory (ASL), White Sands Missile Range, New Mexico. The data were obtained by the following methods:

1. Observations

a. Surface

(1) Standard surface observations to include pressure, temperature ($^{\circ}\text{C}$), relative humidity, dew point ($^{\circ}\text{C}$), density (gm/m^3), wind direction, wind velocity and cloud cover were made at the LC-33 Met Site at T-0 mins.

(2) Anemometer data were provided from existing pole mounted and tower mounted anemometers at LC-33. Monitor of wind speed and direction from one anemometer was also provided in the launch control room.

b. Upper Air

(1) Low level wind data were obtained from RAPTIS-T-9 pibals observation at T-0 mins as follows:

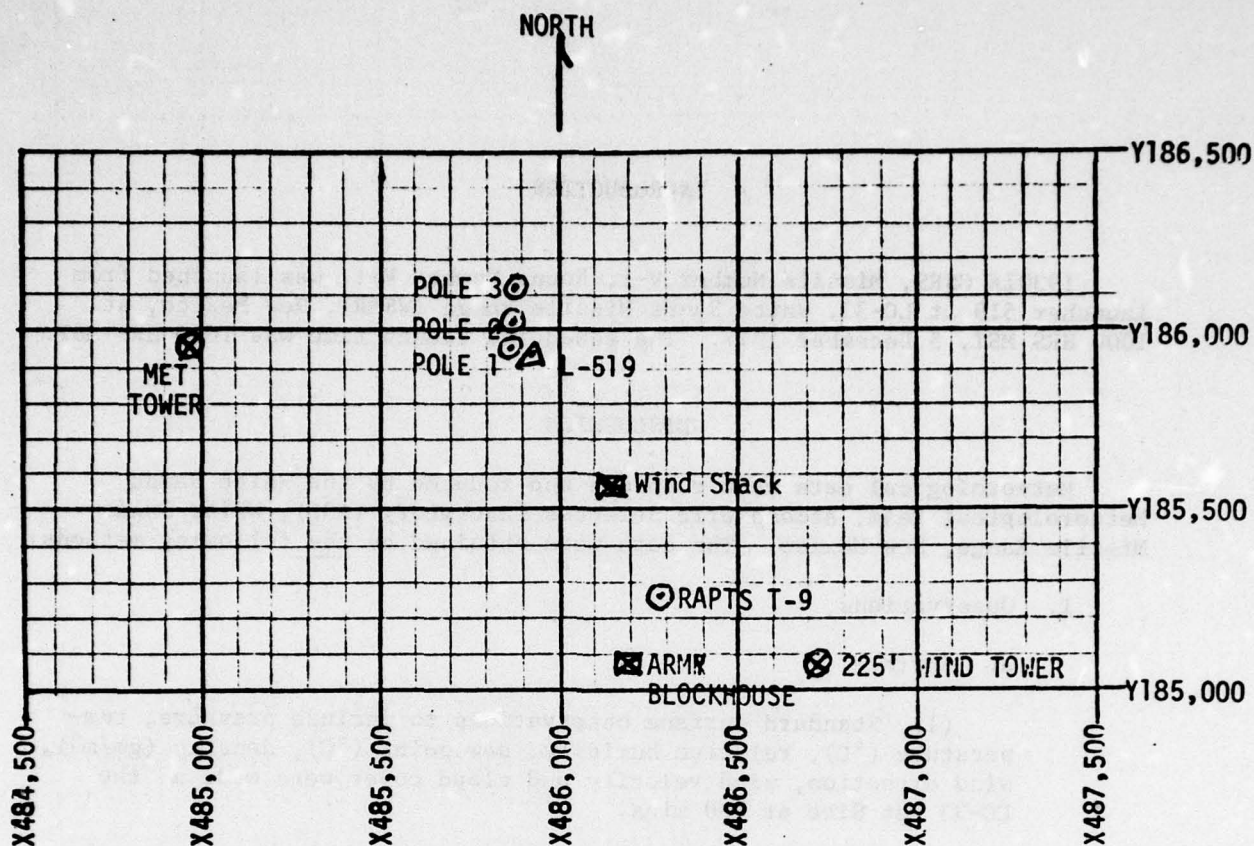
SITE & ALT.

LC-33 900 meters (15 meter incs)

APA 900 meters (30 meter incs)

SMR 900 meters (30 meter incs)

(2) Air structure data (rawinsonde) were collected at the SMR Met Site at T-0 mins. Data were collected from surface to 125% of apogee in 100 meter incs.



1. MET TOWER - 4 Bendix Model T-120 Anemometers at 12 ft, 62 ft, 102 ft and 202 ft with E/A recorders in Wind Shack.
2. POLE ANEMOMETER - Bendix Model T-120 with E/A recorders in Wind Shack
 - (a) Pole #1 - 38.7 ft
 - (b) Pole #2 - 53.0 ft
 - (c) Pole #3 - 83.6 ft
3. 225 FT WIND TOWER - 5 Bendix Model T-120 Anemometers at 35 ft, 88 ft, 128 ft, 168 ft and 200 ft with 5 X-Y visual indicators in Blockhouse.
4. RAPTS T-9 - Radar Automatic Pilot-Balloon Tracking System T-9 Radar

The data are presented in the following tabulations:

ELEVATION	3,987	FEET/MSL
PRESSURE	876.9	MBS
TEMPERATURE	19.7	°C
RELATIVE HUMIDITY	23	%
DEW POINT	-2.0	°C
DENSITY	1,039	GM/M ³
WIND SPEED	06	MPH
WIND DIRECTION	340	DEGREES
CLOUD COVER	CLEAR	

TABLE I. SURFACE OBSERVATIONS TAKEN AT LC-33,
1000 HRS MST/5 DECEMBER 1977

HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)	HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)
SUR	339	6.0	1050	315	18.0
50	335	6.0	1100	312	18.0
100	333	6.5	1150	310	19.5
150	329	6.5	1200	313	20.5
200	327	7.0	1250	316	22.0
250	325	7.0	1300	315	23.0
300	322	7.5	1350	314	22.0
350	316	8.0	1400	312	21.0
400	317	8.0	1450	310	21.5
450	319	9.0	1500	312	22.0
500	321	10.5	1550	313	21.0
550	321	12.5	1600	317	20.0
600	316	14.5	1650	315	20.5
650	313	16.5	1700	315	19.0
700	316	18.0	1750	317	18.0
750	319	18.5	1800	325	17.5
800	316	19.0	1850	328	20.0
850	313	19.0	1900	329	20.5
900	312	19.0	1950	330	20.0
950	311	18.5	2000	328	19.5
1000	313	18.0	2050	325	17.5

TABLE II. RAPTS-T-9 PILOT-BALLOON-MEASURED WIND DATA
RELEASED FROM LC-33, AT 1000 MST/5 DECEMBER 1977
19301A GSRS, MISSILE NO. V-1, ROUND NO. V-1

PIBAL RELEASE POINT WSTM COORDINATES:

X = 486,296.83 Y = 185,251.85 Z = 3,986.67

APPROXIMATELY: 815 FEET SSE OF LAUNCHER.

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)
2100	325	16.0
2150	325	15.0
2200	325	13.5
2250	325	13.5
2300	328	13.5
2350	331	13.5
2400	330	14.0
2450	326	15.0
2500	325	16.5
2550	325	18.0

HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)
2600	328	19.5
2650	332	19.0
2700	335	18.5
2750	337	19.5
2800	340	20.5
2850	344	20.5
2900	341	21.5
2950	339	21.5
3000	337	22.0

TABLE II. (CONT)

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)
SUR	030	10
100	020	11
200	025	14
300	025	12
400	030	15
500	015	18
600	010	22
700	340	25
800	325	23
900	320	22
1000	320	21
1100	315	20
1200	330	24
1300	330	23
1400	320	24
1500	320	22

HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)
1600	320	22
1700	320	23
1800	315	23
1900	320	20
2000	320	19
2100	310	23
2200	310	21
2300	315	20
2400	315	21
2500	315	21
2600	320	24
2700	320	21
2800	320	21
2900	320	21
3000	310	21

TABLE III. RAPTS-T-9 PILOT-BALLOON-MEASURED WIND DATA
RELEASED FROM APACHE, AT 1022 MST/5 DECEMBER 1977
19301A GSRS, MISSILE NO. V-1, ROUND NO. V-1

PIBAL RELEASE POINT WSTM COORDINATES:

X = 481,338.60 Y = 267,644.40 Z = 3,962.07

APPROXIMATELY: 16 MILES NORTH OF LAUNCHER

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)	HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)
SUR	360	02	2100	305	12
100	090	01	2200	305	17
200	076	03	2300	296	15
300	071	06	2400	309	12
400	018	08	2500	311	16
500	014	06	2600	331	16
600	037	06	2700	308	12
700	061	06	2800	352	10
800	088	07	2900	350	11
900	068	06	3000	339	19
1000	024	05	3100	336	16
1100	057	06	3200	327	15
1200	035	03	3300	340	14
1300	025	08	3400	334	14
1400	043	06	3500	340	13
1500	031	10	3600	330	12
1600	033	05	3700	351	13
1700	042	07	3800	353	14
1800	046	06	3900	002	11
1900	028	04	4000	003	10
2000	301	09	4100	005	17

TABLE IV. RAPTS-T-9 PILOT-BALLOON-MEASURED WIND DATA
RELEASED FROM SMR, AT 1000 MST/5 DECEMBER 1977
19301A GSRS, MISSILE NO. V-1, ROUND NO. V-1

PIBAL RELEASE POINT WSTM COORDINATES:

X = 472,441.28 Y = 214,137.54 Z = 3,999.00

APPROXIMATELY: 7 MILES NNW OF LAUNCHER.

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)
4200	346	17
4300	323	18
4400	327	21
4500	345	24
4600	335	24
4700	340	24
4800	333	24
4900	329	22
5000	354	20
5100	356	18
5200	353	22
5300	331	22
5400	333	25
5500	338	31
5600	331	33

HEIGHT (FEET)	DIRECTION (DEGREES)	SPEED (MPH)
5700	334	36
5800	334	40
5900	325	42
6000	324	43
6100	322	41
6200	322	47
6300	327	47
6400	323	43
6500	323	51
6600	318	54
6700	316	51
6800	318	52
6900	314	53
7000	314	57

TABLE IV. (CONT)

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

T-TIME (SEC)	SPEED (MPH)	DIR DEG
-30.0	11.0	355
-20.0	11.5	360
-10.0	12.0	358
-00.00	15.5	360
+10.00	12.0	357
+20.00	11.0	52
+30.00	12.0	50

TABLE V. ANEMOMETER-MEASURED WIND SPEED AND DIRECTION, POLE 38.7 FT.
19301A GSRS, MISSILE NO. V-1, ROUND NO. V-1
LAUNCHED FROM LC-33, 1000 MST/5 DECEMBER 1977

WSTM COORDINATES: X = 485,874.29 Y = 185,958.90 H = 4,018.74

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

T-TIME (SEC)	SPEED (MPH)	DIR DEG
-30.0	11.0	358
-20.0	16.0	23
-10.0	15.0	16
-00.00	16.0	05
+10.00	14.0	29
+20.00	11.5	50
+30.00	11.5	49

TABLE VI. ANEMOMETER-MEASURED WIND SPEED AND DIRECTION, POLE 53.0 FT.
19301A GSRs, MISSILE NO. V-1, ROUND NO. V-1
LAUNCHED FROM LC-33, 1000 MST/5 DECEMBER 1977

WSTM COORDINATES: X = 485,874.93 Y = 186,012.00 H = 4,033.57

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

T-TIME (SEC)	SPEED (MPH)	DIR DEG
-30.0	16.0	348
-20.0	16.0	08
-10.0	17.0	03
-00.00	16.0	02
+10.00	12.5	36
+20.00	10.0	37
+30.00	10.5	38

TABLE VII. ANEMOMETER-MEASURED WIND SPEED AND DIRECTION, POLE 83.6 FT.
19301A GSRS, MISSILE NO. V-1, ROUND NO. V-1
LAUNCHED FROM LC-33, 1000 MST/5 DECEMBER 1977

WSTM COORDINATES: X = 485,877.29 Y = 186,116.06 H = 4,063.92

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

T-TIME (SEC)	SPEED (MPH)	DIR DEG
-30.0	10.0	55
-20.0	15.0	72
-10.0	13.5	94
-00.00	11.0	110
+10.00	12.0	100
+20.00	12.0	97
+30.00	11.0	108

TABLE VIII. ANEMOMETER-MEASURED WIND SPEED AND DIRECTION, TOWER LEVEL 12 FT.
19301A GSRs, MISSILE NO. V-1, ROUND NO. V-1
LAUNCHED FROM LC-33, 1000 MST/5 DECEMBER 1977

WSTM TOWER COORDINATES: X = 486,717.18 Y = 185,067.16 H = 4,179.87

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

T-TIME (SEC)	SPEED (MPH)	DIR DEG
-30.0	15.0	25.0
-20.0	11.0	M
-10.0	13.5	M
-00.00	15.0	M
+10.00	13.5	M
+20.00	12.5	M
+30.00	12.5	M

TABLE IX. ANEMOMETER-MEASURED WIND SPEED AND DIRECTION, TOWER LEVEL 62 FT.
19301A GSRS, MISSILE NO. V-1, ROUND NO. V-1
LAUNCHED FROM LC-33, 1000 MST/5 DECEMBER 1977

WSTM TOWER COORDINATES: X = 486,717.18 Y = 185,067.16 H = 4,179.87

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

T-TIME (SEC)	SPEED (MPH)	DIR DEG
-30.0	17.0	28
-20.0	12.0	348
-10.0	11.5	340
-00.00	14.0	340
+10.00	15.0	335
+20.00	16.0	325
+30.00	11.5	320

TABLE X. ANEMOMETER-MEASURED WIND SPEED AND DIRECTION, TOWER LEVEL 102 FT.
19301A GSRS, MISSILE NO. V-1, ROUND NO. V-1
LAUNCHED FROM LC-33, 1000 MST/5 DECEMBER 1977

WSTM TOWER COORDINATES: X = 486,717.18 Y = 185,067.16 H = 4,179.87

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

T-TIME (SEC)	SPEED (MPH)	DIR DEG
-30.0	22.5	M
-20.0	19.0	M
-10.0	19.0	M
-00.00	18.5	M
+10.00	18.5	M
+20.00	19.0	M
+30.00	20.0	M

TABLE XI. ANEMOMETER-MEASURED WIND SPEED AND DIRECTION, TOWER LEVEL 202 FT.
19301A GSRS, MISSILE NO. V-1, ROUND NO. V-1
LAUNCHED FROM LC-33, 1000 MST/5 DECEMBER 1977

WSTM TOWER COORDINATES: X = 486,717.18 Y = 1-5,067.16 H = 4,179.87

NOTE: WIND DIRECTION DATA ARE REFERENCED TRUE NORTH.

GEODETIC COORDINATES
 32.44034 LAT DEG
 106.42307 LON DEG

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SIGNIFICANT LEVEL DATA

3590000164

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TABLE XI.

STATION ALTITUDE 3997.30 FEET MSL
 5 DEC. 77 1000 MRS MSL
 ASCENSION 10. 109

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE MSL FEET	TEMPERATURE		REF. HUM. PERCENT
		AIR DEGREES	DEWPOINT CENTIGRADE	
076.9	3997.3	21.0	-2.1	21.0
065.0	4359.9	17.4	-5.1	21.0
050.0	4873.0	15.8	-6.5	21.0
737.0	0746.7	6.5	-9.6	30.0
700.0	10152.9	3.1	-12.0	32.0
074.0	11164.7	6.6	-14.7	20.0
050.0	11776.7	5.2	-16.5	19.0
067.0	15643.7	-4.5	-21.5	25.0
000.0	18923.9	-11.2	-26.4	26.0
+59.3	21041.6	-15.5	-29.4	29.0

UPPER AIR DATA
3390060164
S M R
TABLE XIII.

STATION ALTITUDE 397.30 FEET MSL
5 DEC. 77
1000 MRS MSL
ASCENSION 10. 169

GEODTIC COORDINATES
32.44034 LAT NFG
106.42307 LON DFG

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
397.3	876.9	21.0	21.0	1036.2	668.9	30.0	4.1	1.000254
400.0	870.8	21.0	21.0	1036.2	668.9			1.000254
450.0	861.5	17.0	21.0	1032.6	664.1			1.000244
500.0	846.1	15.5	21.3	1019.4	662.4			1.000244
550.0	830.6	14.3	22.5	1005.2	661.0			1.000241
600.0	815.7	13.1	23.6	991.1	659.7			1.000237
650.0	800.9	11.9	24.8	977.3	658.3			1.000234
700.0	786.4	10.7	25.9	963.7	656.9			1.000230
750.0	772.2	9.5	27.1	950.3	655.5			1.000227
800.0	758.2	8.3	28.3	937.1	654.1			1.000224
850.0	744.5	7.1	29.4	924.1	652.7	323.9	15.6	1.000220
900.0	730.8	5.9	30.4	911.1	651.2	327.2	19.0	1.000217
950.0	717.3	4.7	31.1	898.2	649.8	329.5	22.5	1.000213
1000.0	704.0	3.5	31.8	885.4	648.4	329.2	25.0	1.000210
1050.0	691.0	4.3	27.9	866.5	649.3	328.4	27.3	1.000204
1100.0	678.2	6.0	22.0	845.3	651.3	322.8	28.4	1.000194
1150.0	665.6	5.8	19.5	830.3	651.0	308.7	30.3	1.000190
1200.0	653.2	4.6	19.3	818.4	649.6	306.3	37.7	1.000187
1250.0	640.9	3.4	20.1	806.6	648.2	304.4	40.3	1.000185
1300.0	628.8	2.2	20.9	795.0	646.7	299.3	35.8	1.000182
1350.0	617.0	.9	21.6	783.6	645.2	294.4	33.2	1.000179
1400.0	605.4	-.3	22.4	772.3	643.8	292.2	34.2	1.000176
1450.0	594.0	-1.6	23.2	761.3	642.3	291.0	35.0	1.000173
1500.0	582.8	-2.8	24.0	750.4	640.8	293.2	36.3	1.000171
1550.0	571.0	-4.0	24.7	739.6	639.3	294.0	36.8	1.000168
1600.0	560.8	-5.2	25.1	728.5	638.0	294.9	35.7	1.000165
1650.0	549.9	-6.2	25.3	717.1	636.7	295.1	34.5	1.000162
1700.0	539.2	-7.2	25.4	705.9	635.5	295.9	33.8	1.000150
1750.0	528.7	-8.3	25.6	694.9	634.3	297.0	33.2	1.000157
1800.0	518.5	-9.3	25.7	684.1	633.0	298.0	33.1	1.000157

AX AND DATA INVALID DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.

STATION ALTITUDE 3997.30 FEET MSL
5 DEC. 77
ASCENSION NO. 109

UPPER AIR DATA
3390000149
S M R
TABLE XIII. (CONT)

GEODETIC COORDINATES
32.44034 LAT DEG
106.42307 LON DEG

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE				DIRECTION DEGREES(TN)	SPEED KNOTS	
13500.0	503.4	-10.3	-26.1	25.9	673.5	631.7	298.0	33.1	1.000154
19000.0	496.5	-11.4	-26.3	26.1	663.0	630.5	297.6	32.8	1.000151
19500.0	488.0	-12.4	-27.5	26.2	652.4	629.3	296.1	32.4	1.000149
20000.0	478.9	-13.4	-28.1	27.5	641.9	628.0			1.000146
20500.0	469.4	-14.4	-28.7	28.2	631.7	626.8			1.000144
21000.0	460.1	-15.4	-29.4	23.9	621.6	625.6			1.000141

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STATION ALTITUDE 3497.30 FEET MSL
 5 DEC. 77
 ASCENSION NO. 109

MANDATORY LEVELS
 3390060164
 S M R
 TABLE XIV.

GEODETIC COORDINATES
 32.44034 LAT DEG
 106.42307 LON DEG

PRESSURE GEOPCENTIAL MILLIBARS	FEET	TEMPERATURE		REL. HUMID. PERCENT	WIND DATA	
		AIR DEGREES	DEWPOINT CENTIGRADE		DIRECTION DEGREES(TN)	SPEED KNOTS
850.0	4872.	15.8	-6.5	21.	9999.0	9999.0XX
800.0	5547.	11.8	-7.6	25.	9999.0	9999.0XX
750.0	8304.	7.6	-9.3	29.	329.5	24.1
700.0	10153.	3.1	-12.0	32.	311.3	32.6
650.0	12137.	4.3	-16.9	20.	297.5	34.6
600.0	14253.	-0.9	-19.5	23.	292.8	35.5
550.0	16500.	-6.2	-22.6	25.	295.1	34.5
500.0	18932.	-11.2	-26.8	26.	298.0	32.8

AX WIND DATA INVALID DUE TO MISSING RAW AZIMUTH AND ELEVATION ANGLES.

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